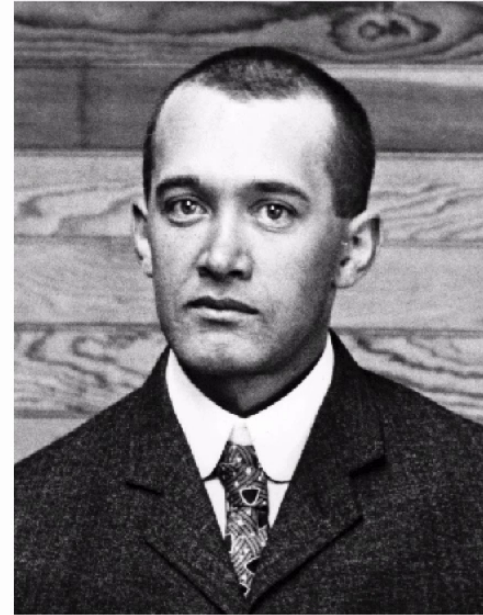


The Expanding Universe

1

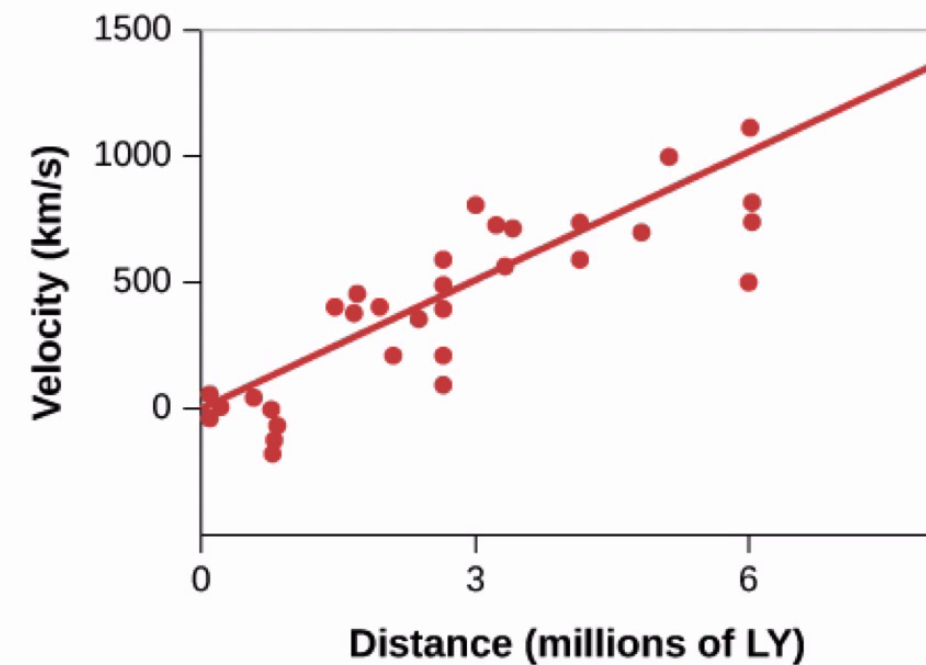
Beginning in 1912, Vesto Slipher measured spectra of galaxies and found large redshifts: galaxies are moving away from us



2

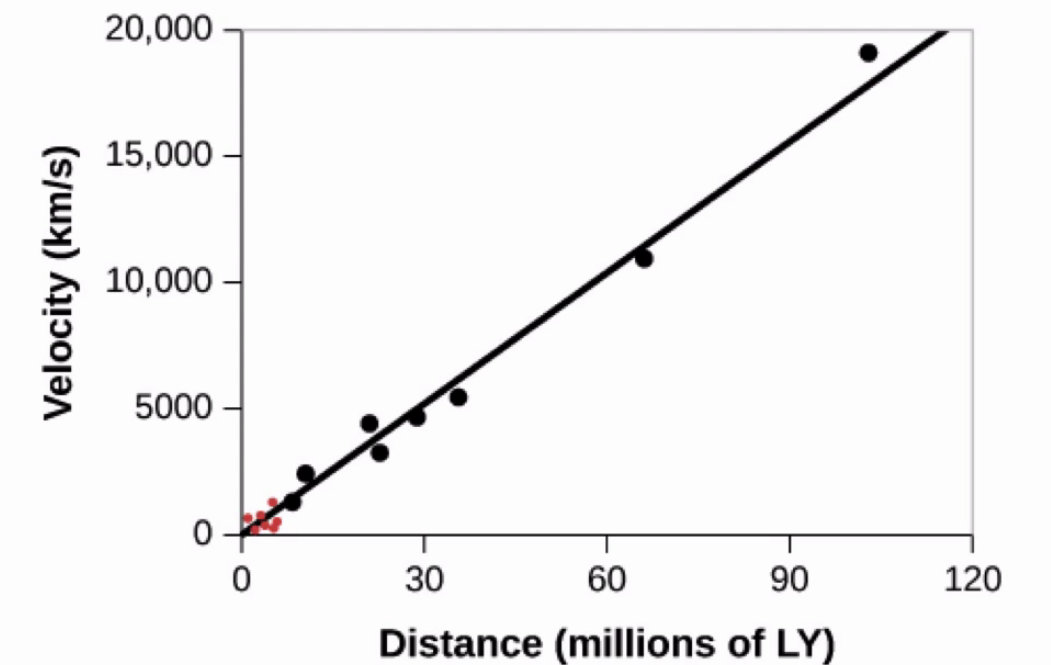
Edwin Hubble & Milton Humason found that the recession velocity is proportional to the galaxy's distance

Hubble's Data (1929)



(a)

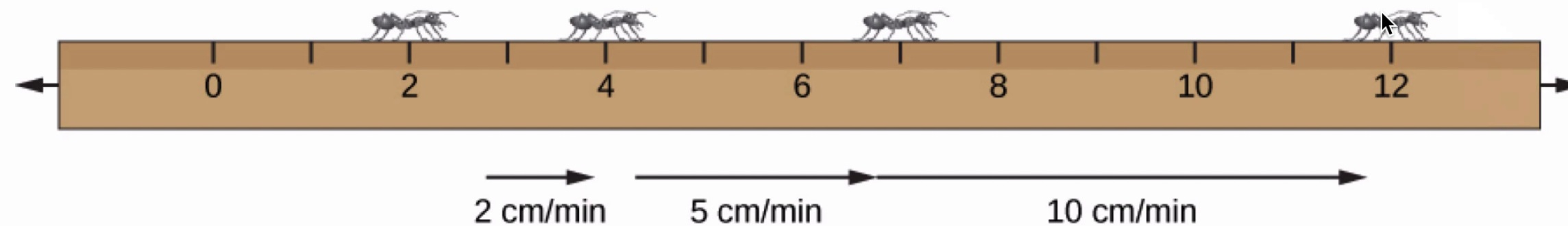
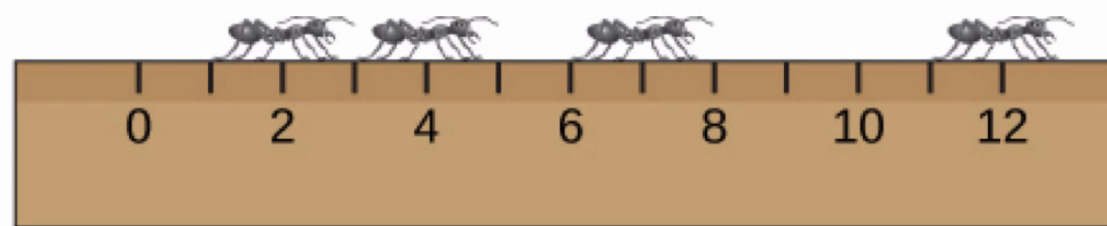
Hubble and Humason (1931)



(b)

4

Hubble's law is a consequence of the uniform expansion of the Universe



3

Mathematically, this proportionality can be expressed by the Hubble Law:

$$V = H \times d$$

Hubble's constant H is about 22 km/s per million light years